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Attorney Docket No. SPF 0002 PA / former SPB 0004 PA
Serial No. - 09/341,101

OFFICIAL AMENDMENT**REMARKS**

Claims 1-31 are pending in the present application. Claims 5, 8 and 29 have been amended.

Rejections Under 35 U.S.C. §102(b)

Claims 1, 14, 28, 29 and 31 were rejected under 35 U.S.C. §102(b) as being anticipated by WO95/28524, published October 26, 1995, hereinafter "Gudat". According to the M.P.E.P. §706.02, in order to be anticipating under §102, the reference must teach every aspect of the claimed invention. See Carella v. Starlight Archery and Pro Line Co., 804 F.2d 135, 138, 231 U.S.P.Q. 644, 646 (Fed. Cir. 1986).

Rejection with Respect to Claim 1

With respect to claim 1, Gudat does not meet the burden of establishing a *prima facie* case of anticipation under 35 U.S.C. §102 because Gudat fails to teach (or suggest for that matter), a position determining apparatus on a machine that provides data corresponding to the orientation of a designated place on the machine in a fixed coordinate system.

Gudat teaches an apparatus for directing earth moving machines about a construction site. Basically, the construction site is subdivided into a continuous matrix of unit areas that are illustrated on a display. Using a known three-dimensional positioning system, machine *position coordinates* are determined and supplied to a processor as a series of *discrete points* (page 9, lines 17-21). Digitized models of the topography of the work site (actual and desired) are fed into the processor, and an algorithm is provided that computes the difference between the actual and desired site maps from the position coordinates of the machine. The new model of the actual work site is then updated, and displayed (page 9, lines 25-34).

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OFFICIAL AMENDMENT**Gudat Does Not Teach or Suggest Determining the Orientation of the Working Machine**

In making the rejection to claim 1, the Examiner is apparently asserting that the recitation of a position determining apparatus configured to provide data that corresponds to the orientation of a designated place on a working machine is anticipated by Fig. 4 of Gudat. However, Fig. 4 merely supports that described above. That is, the working machine is equipped with a GPS receiver 18 and a radio link 58 for transmitting positional data. There is no indication of any orientation measuring device at all.

This observation is supported throughout the specification of Gudat. For example, Gudat teaches providing each machine with a three-dimensional positioning system (page 7 lines 1-2). Using kinematic GPS or other suitable 3-D position signals from an external reference, the location of the machines are determined on a point by point basis (page 8, lines 2-10). As seen in the flow chart of Fig. 2, and as described on page 9, lines 15-25, using known 3-D positioning systems, machine position coordinates are tracked as a series of discrete points. The measured points are fed into a differencing algorithm that calculates the machine position and path.

It should be clear that merely recording discrete three-dimensional points does not in any way teach or suggest determining both position and orientation of a designated place on the machine. For example, in Gudat, the real time path of the machine relative to the site between position readings is determined with a differencing algorithm that determines effective parameters of the operative portion of the machine (page 3, lines 5-12). As such, there is a time lag between the accumulation of discrete positional data points. The time lag is typically sufficient for a machine to travel three to four display units of distance. Gudat addresses the time lag issue by using algorithms to "guess" the path of the machine between discrete samples. For example, Gudat teaches the use of Bresenham's algorithm to smooth the discrete samples and update the display (page 29, lines 19-33).

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The obvious consequence of the approach taught in Gudat is that the actual orientation of the machine is never known. This is particularly problematic where the orientation of the machine may be ambiguous, such as where a machine can travel backwards or sideways.

The specification in Gudat may be confusing in some respects because Gudat teaches that the computer can compute "orientation". However, "orientation" as used in Gudat is apparently determined based upon the approximation of a line estimated from the Bresenham's algorithm computed against prior discrete points that chart the travel of the machine. However, the line that charts prior discrete points merely reflects direction of travel, from which orientation may arguably be assumed. However, such a method of determining orientation is not unambiguous, and therefore, not capable of producing dependable output. This can be easily seen as many machines are capable travel in reverse or sideways directions. This shortcoming is identified in the present specification on page 2, lines 27-29.

Moreover, even assuming *arguendo* that orientation can be determined, which the applicants rigorously assert it cannot, it should be clear that orientation is computed by an external computer based upon previous measurements of position, not by determining the orientation of a designated place on the machine in a fixed coordinate system as claimed.

With respect to claim 29, the recitation of "adapted to" has been removed from the claim. Further, it should be pointed out that claim 29 depends from claim 5, which was not rejected under 35 U.S.C. §102(b). If a base claim is not anticipated by the prior art, then a claim dependent from that base claim cannot be anticipated.

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Accordingly, the applicants request that the Examiner withdraw the rejection of claim 1, and the claims that depend therefrom, under 35 U.S.C. §102(b).

Rejection with Respect to Claim 14

With respect to claim 14, Gudat does not teach (or suggest for that matter), a method comprising measuring an orientation of a designated place on a machine in a fixed coordinate system. Arguments in support thereof are analogous to those described in greater detail above with reference to claim 1, and therefore will not be discussed further.

Additionally, Gudat does not teach or suggest calculating the instantaneous orientation of the working part of the machine in a fixed coordinate system. From the above discussion of Gudat, it should be clear that from discrete three-dimensional position samples, the best one could compute is a guess of direction of travel in time that is not *per se*, unambiguous to the orientation of the machine. Moreover, even the direction computations are not instantaneous as they are dependent upon an accumulation of prior samples in order to effectively implement the Bresenham's algorithm.

Accordingly, the applicants request that the Examiner withdraw the rejection of claim 14, and the claims that depend therefrom, under 35 U.S.C. §102(b).

35 U.S.C. §103(a)**Rejection Under 35 U.S.C. §103 Gudat in view of Diekhans**

Claims 3, 6 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gudat in view of U.S. Pat. No. 6,073,070 (hereinafter "Diekhans"). According to the MPEP §706.02(j) and §2143.03, in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.

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Claims 3 and 6 depend from claim 1 and claim 19 depends from claim 14. As pointed out above, Gudat fails to teach all the limitations of claims 1 and 14, and thus does not teach all of the limitations of the above-rejected claims. Moreover, Diekhans does not teach or suggest a position determining apparatus on a machine that provides data corresponding to the orientation of a designated place on the machine in a fixed coordinate system or a method comprising measuring an orientation of a designated place on a machine in a fixed coordinate system as claimed in claims 1 and 14 respectively.

Further, Diekhans fails to teach or suggest a calculating device configured to provide at least one of the position and the orientation of the working part of the tool in the fixed coordinate system based upon the position and orientation of the designated place on the machine in a fixed coordinate system and the positional relationship of the working part of the tool relative to the designated place on the machine in the machine-based coordinate system. Arguments in support of the above were set out in detail in the applicant's response filed Feb. 17, 2003 in response to the previous Office Action, and will thus not be discussed in greater detail herein.

"All words in a claim must be considered in judging the patentability of that claim against the prior art" *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). Diekhans not teach or suggest a position-determining apparatus configured to provide data that corresponds to the orientation of a designated place on the machine in a fixed coordinate system. Accordingly, the applicant requests that the Examiner withdraw the rejection of claim 1 and the claims that depend therefrom under 35 U.S.C. §103.

Still further, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. See MPEP §706.02(j); MPEP §2143; *In re Mills*, 916 F.2d 680, 16

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USPQ2d 1430 (Fed. Cir. 1990). In asserting the above rejection, the Examiner identifies claimed limitations from both Deikans and Gudat, then concludes that the combination of the references would be obvious in order to optimize the operation of the vehicle. However, such motivation appears to come from the Examiner's own personal conjecture, and no cites were provided to the references to support the combination of the references.

Accordingly, the applicants request that the Examiner withdraw the rejection of claims 3, 6, and 19 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Ford

Claims 2, 4, 7, 15, 27 and 30 were rejected under 35 U.S.C. §103 as being unpatentable over Gudat in view of U.S. Patent No. 6,211,821 issued April 03, 2001 to Ford; hereinafter "Ford". Claims 2, 4, 7 and 27 depend from claim 1. Claims 15, 27 and 30 depend from claim 14. As described more fully above, Gudat fails to establish *prima facie* obviousness for either claims 1 or 14.

Ford teaches a navigational apparatus that uses satellite signals to compute corrected positions. The section of Ford cited by the Examiner in the above rejection however, is the background section wherein it is stated that redundant north seeking gyroscopes have been used to determine the azimuth of a ship or aircraft.

Ford does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Gudat above. Instead, the Examiner relies on the background of a reference rather than a teaching in the reference itself. In the context of the present rejection, the generalized statements provided by the background of Ford and the lack of explanation by the Examiner in the Office Action provides neither the motivation

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to combine nor an establishment of the likelihood of success as required by the M.P.E.P. §706.02(a).

Again, the Examiner does not identify any motivation to combine the references. Rather, the Examiner provides the generalization that the combination would "enhance the system". The applicants cannot find support for such an assertion in the references.

Moreover, the applicant does not understand this rejection. Claims 4 and 7 do not recite a north-seeking target unit. Accordingly, the applicant requests that the Examiner withdraw the above rejections under 35 U.S.C. §103.

Rejection Under 35 U.S.C. §103 Gudat in view of Johnson

Claims 5, 8, 18 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of U.S. Patent No. 5,606,444 issued February 25, 1997 to Johnson et al. hereinafter "Johnson". Claims 5 and 8 depend from claim 1 and have been amended herein to remove the recitation of "adapted to". Claims 18 and 20 depend from claim 14. As described more fully above, Gudat fails to establish *prima facie* obviousness for either claims 1 or 14.

Johnson teaches automatic alignment of optical data transceivers with respect to a likely moving computer in an aircraft and a stationary computer at a ground location. Johnson states in the background that "...free space optical communications systems often have a narrow field of view and, as such, require additional control systems to align the optical transceivers to ensure proper data transmission" (Col. 2, lines 9-12). The system in Johnson is "passive" such that no special equipment is needed to align the optical transceivers (Column 7, lines 36-41).

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Johnson does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Gudat. Further, Johnson even when combined with Gudat still fails to teach or suggest all of the limitations of the above-rejected claims. The Examiner again relies on the background of a reference instead of a teaching in the reference itself. In the context of the present rejection, the generalized statements provided by the background of Johnson and the lack of explanation by the Examiner in the Office Action provides neither the motivation to combine nor an establishment of the likelihood of success as required by the M.P.E.P. §706.02(a). Additionally, even if the Examiner could use this teaching, which the applicants assert is wholly improper, the references still fail to teach or suggest all of the claimed limitations.

With respect to claim 18, Gudat combined with Johnson fails to teach or suggest rotatably mounting at least one controllable optical unit on the working machine, indicating the orientation of the optical unit in relation to the working machine and calculating the orientation of the working machine in the fixed coordinate system.

Again, the Examiner does not identify any motivation to combine the references. Rather, the Examiner provides the generalization that the combination would "enhance the system". The applicants cannot find support for such an assertion in the references.

Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 5, 8, 18 and 20 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Schupfner

Claims 9 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of U.S. Patent No. 6,374,190 issued April 16, 2002 to Schupfner hereinafter "Schupfner". Claim 9 depends from claim 1. Claim 22 depends from claim 14.

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As described more fully above, Gudat fails to establish *prima facie* obviousness for either claims 1 or 14.

The Examiner cites Column 1, lines 17-25 in support of the rejection to claims 9 and 22. The applicant respectfully traverses this rejection. The passage in Schupfner cited by the Examiner deals with variations in inexpensive gyroscopes used in navigation systems due to temperature dependence. Further, Schupfner teaches a method of calibrating an angle sensor influenced by operating temperature. Schupfner has nothing whatsoever to do with that which is claimed in claims 9 and 22, that is, providing a map with stored topology of an area to be treated and presenting data for the working part relative to the map on a presentation unit.

Moreover, Schupfner does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Gudat.

Yet again, the Examiner does not identify any motivation to combine the references. Rather, the Examiner provides the generalization that the combination would "enhance the system". The applicants cannot find support for such an assertion in the references.

Accordingly, the applicant requests the Examiner withdraw the rejection to claims 9 and 22 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Johnson and Ford

Claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of Johnson, and further in view of Ford. Claim 21 depends from claim 14.

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As described more fully above, Gudat combined with Johnson fails to establish *prima facie* obviousness for claim 14.

The applicant does not understand this rejection. Claim 21 does not recite a north seeking target. Further, as pointed out above, Gudat combined with Ford and Johnson still fail to teach or suggest all of the limitations to claim 14 from which claim 21 depends. Accordingly, the applicant requests that the Examiner withdraw the rejection to claim 21 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Ethridge

Claims 10 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of U.S. Patent No. 5,798,733 issued August 25, 1998 to Ethridge, hereinafter "Ethridge". Claim 10 depends from claim 1. Claim 23 depends from claim 14. As described more fully above, Gudat fails to establish *prima facie* obviousness for either claims 1 or 14.

The Examiner cites Column 2, lines 17-23 in support of this rejection. This passage of Ethridge has nothing at all do with the claimed invention. Specifically, Ethridge combined with Gudat fails to teach or suggest both a relatively slow determining device and a relatively fast determining device that reacts on at least one of position and orientation differences. Ethridge teaches a location guidance system for parachute jumpers. Basically, future positions of parachute jumpers are predicted based upon current position information and some pre-stored information that contains data with respect to the target position and profile of the projected jumper landing site. At periodic update intervals, the predicted destination position is updated (Column 5, lines 10-25).

Moreover, Ethridge does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations

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discussed above with respect to Gudat. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 10 and 23 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Ethridge and Vanderwerf

Claims 11 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of Ethridge and further in view of U.S. Patent No. 5,774,832 issued August 25, 1998 to Vanderwerf, hereinafter "Vanderwerf". Claim 11 depends from claim 1. Claim 24 depends from claim 14. As described more fully above, Gudat combined with Ethridge fails to establish *prima facie* obviousness for either claims 1 or 14.

Vanderwerf does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Gudat. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 11 and 24 under 35 U.S.C. §103(a).

Rejection Under 35 U.S.C. §103 Gudat in view of Ethridge and Yamada

Claims 12 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gudat in view of Ethridge and further in view of U.S. Patent No. 5,974,675 issued November 02, 1999 to Yamada et al., hereinafter "Yamada". Claim 12 depends from claim 1. Claim 25 depends from claim 14. As described more fully above, Gudat combined with Ethridge fails to establish *prima facie* obviousness for either claims 1 or 14.

Yamada does not teach or suggest all of the limitations of claims 1 and 14 from which the above-rejected claims depend, including for example, those limitations discussed above with respect to Gudat. Accordingly, the applicant requests that the Examiner withdraw the rejection to claims 12 and 25 under 35 U.S.C. §103(a).

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OFFICIAL AMENDMENT**Allowable Subject Matter**

The applicants would like to thank the Examiner for the early indication of allowable subject matter. However, claim 20 is not rewritten into independent form herein because the applicants believe that, based upon the amendments and clarifying comments herein, the claims from which claim 20 depends are also allowable.

CONCLUSION

For all of the above reasons, the applicant respectfully submits that the pending claims represent allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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